WISCONSIN ENDANGERED RESOURCES REPORT # 120
STATUS OF THE TIMBER WOLF IN WISCONSIN
PERFORMANCE REPORT 1 JULY 2000 THROUGH 30 JUNE 2001

By Adrian P. Wydeven and Jane E. Wiedenhoeft

SUMMARY

This report covers activities conducted from 1 July 2000 through 30 June 2001. The Wisconsin DNR reclassified the wolf from state endangered to threatened in 1999, and on 27 October 1999 the Wisconsin Natural Resources Board passed a wolf management plan for the state. In July 2000, the USFWS began the process to federally reclassify wolves from endangered to threatened.

Thirteen wolves from 10 different packs were live-captured and radio collared in 2000. Fifty-one radio collared wolves were monitored during the study period. Mean territory size of 22 adult wolves with VHF radio collars was 34 square miles. The minimum count for the wolf population in winter 2000-2001 was 251-253 wolves in 66 packs, including 243-246 wolves occurring outside Indian reservations. Fourteen radio collared wolves died in the state during the study period from the following: 5 sarcoptic mange, 1 sarcoptic mange and inner ear infection, 1 other wolves, 2 shootings, 2 vehicle collisions, 1 capture related and 2 unknown. Ten non-collared wolves found dead in the state were all due to vehicle collisions. Disease testing has not been completed on wolves captured in 2000. Mange apparently was prevalent in some wolves during winter, and may have reduced the growth of the population. Wolves were reported from 40 Wisconsin counties during the study period. Eight cases of wolf depredation occurred during the period and involved death of 2 calves (30 missing), 3 dogs and 64 poultry. Other strategies to implement the new wolf program were also conducted during the period.

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RECOVERY OF THE TIMBER WOLF
PERFORMANCE REPORT

1 July 2000-30 June 2001

Prepared by Adrian P. Wydeven and Jane E. Wiedenhoeft

Job: 106.1 Wolf Management Zones
106.2 Population Monitoring and Management
106.3 Wolf Health Monitoring
106.4 Habitat Management
106.5 Wolf Depredation Management
106.6 Wolf Education Programs
106.7 Law Enforcement
106.8 Interagency Cooperation and Coordination
106.9 Program Guidance and Oversight
106.10 Volunteer Programs
106.11 Wolf Research
106.12 Wolf Dog Hybrids and Captive Wolves
106.13 Wolf Specimen Management
106.14 Ecotourism

Background: Timber wolves (*Canis lupus*) were listed as endangered species in the Great Lakes region in 1967 and 1974 by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service 1992). The State of Wisconsin listed wolves as endangered in 1975, but reclassified them to threatened in 1999, after the population had remained above 80 wolves for 5 years. The Wisconsin Department of Natural Resources (DNR) has monitored the state wolf population since 1979. A recovery plan with a reclassification goal of 80+ wolves was completed in 1989 (Wisconsin DNR 1989), and a management plan was completed in 1999 (Wisconsin DNR 1999). The management plan sets a state delisting goal of 250 wolves outside of Indian reservations and a management goal of 350 wolves outside of Indian reservations. At the management goal, proactive population control activities may be conducted by government trappers, and public harvest of wolves may be considered. The plan includes 14 management strategies that represent the general outline for this report.

The 1992 Federal Recovery Plan for the eastern timber wolf established reclassification goals of 80+ wolves for 3 years in Wisconsin, and delisting goal of 100+ wolves for 5 years for Wisconsin and Michigan (U.S. Fish and Wildlife Service 1992). Delisting also required a stable population in Minnesota of 1251 to 1400 wolves. The Minnesota population included 2450 wolves in 1998 (Berg and Benson 1999) and currently probably exceeds 2600. In 2001 Michigan and Wisconsin shared about 500 wolves, and had exceeded the 100+ threshold for 7 years. In July 2000, the U.S. Fish and Wildlife Service began the process to reclassify wolves to threatened in Wisconsin and Michigan (Minnesota has been listed as threatened since 1978), and hopes to complete that process sometime in 2001. The process to delist wolves in the western Great Lakes region should start soon thereafter and could be completed in 12 to 18 months.

Personnel and funding: Funding for wolf conservation activity in Wisconsin was from the following: Federal Aide in Wildlife Restoration Project W-154-R; U.S. Fish and Wildlife Service, Endangered Species Grants; funds from the Nicolet-Chequamegon National Forest; Wisconsin Endangered Resources Fund (Tax check-off and license plate); Timber Wolf Alliance (TWA); Timber Wolf Information Network (TWIN); and private donations. Adrian Wydeven was the ecologist in charge of the project, and was assisted by project wolf technicians Ron Schultz, Sarah Boles, and Jane Wiedenhoeft. DNR pilots conducting aerial monitoring of collared wolves included: Paul Anderson, Phil Miller, Joe Sprenger, John

Bronson and Mike Weinfurter. Other DNR personnel that assisted extensively on wolf monitoring included Dick Thiel, Wayne Hall, Bruce Kohn, Kerry Beheler, Michele Kastler, Randy Jurewicz, Ken Jonas, Greg Kessler, Todd Naas, John Schmidt, Bruce Bacon, Rich Wissink, Linda Winn and Dr. Julie Langenberg. Wolf trapping was also done by retired Wildlife Services technician Buck Follis. Dead wolves were necropsied by Dr. Nancy Thomas and coordinated through Dr. Kim Miller of the National Wildlife Health Center in Madison. Live trapping and field investigations of wolf depredations were conducted under the supervision of Bob Willging, Kelly Thiel and Scott Beckerman of USDA-APHIS-Wildlife Services. About 108 volunteers participated in tracking wolves and other carnivores across northern and central Wisconsin during the winter.

JOB 106.1 WOLF MANAGEMENT ZONES

Four wolf management zones were created in the 1999 Wolf Management Plan. Wolf populations and management activities are summarized for each zone below.

Zone 1 represents the northern forest wolf range in Wisconsin, and in winter 2000-2001 contained 214-216 wolves. Twenty-one counties extend partially or completely into this zone, and wolf packs occurred in at least 10 counties. Wolf observations were reported from 18 counties. Verified depredation by wolves on livestock or poultry occurred on 4 different farms in the zone. One depredating wolf was live trapped off a farm and relocated locally. Three free-roaming dogs were killed in two different cases in the zone. The average deer density in the zone was 30 deer/mile^2 (range 12-49 deer/mile^2) and was considerably above the goal population of an average density of 19 deer/mile^2.

Zone 2 represents the central forest wolf range and contained 37 wolves in winter 2000-2001. The zone included part of 10 counties, but contained only small portions of Waushara, Marquette, and Chippewa counties. Wolf packs occurred in 6 counties and wolf observations were reported from 9 counties. No wolf depredations occurred in this zone during the study period. Deer density in Zone 2 averaged 35 deer/mile^2, and the goal population for the zone would have an average deer density of 28 deer/mile^2.

Zone 3 represents the dispersal habitat for wolves across central Wisconsin and includes portions of 33 counties. No wolf packs were known to exist in Zone 3 during the study period. Wolf observations were reported for 22 counties within the zone, but 14 of these counties also contained portions of Zones 1 and 2. One wolf depredation on a calf occurred on a farm in Zone 3, but the depredation may have been from a wolf dog hybrid. At least 2 wolves dispersed through Zone 3 during the study period. An adult male (not collared) was killed by a vehicle near Bonduel in Shawano County in late December 2000. An adult male (337M) dispersed eastward from central Jackson County into Adams, and through Waushara and Marquette counties before disappearing in northern Columbia County in January 2001. His route south followed the eastern edge of Zone 2, and his last 2 locations were in Marquette (Zone 3) and Columbia (Zone 4) counties. In addition to these two wolves, a female wolf (M071F) from Michigan was killed by a vehicle collision in Jefferson County (Zone 4) in March 2001; she probably traveled through portions of Zone 3 on the way to Jefferson County.

Zone 4 represents portions of southern and eastern Wisconsin with very little potential for wolves. No packs were detected in the 28 counties in this zone; wolf observations were reported for 7 counties. Movements of wolf 337M into Columbia County and wolf M071F into Jefferson County, indicates that dispersing wolves can travel into this zone. Most reports of wolf observations in this zone probably continue to be from large coyotes, wolf-like dogs or wolf dog hybrids. No wolf depredations on pets or livestock occurred in Zone 4.

JOB 106.2 POPULATION MONITORING AND MANAGEMENT

Fifteen wolves were live captured in 2000 and radio collars were placed on 13 (Table 1). Two wolves were captured by USDA-WS and translocated from depredation sites (289F and 332F). Captured wolves were from 10 different wolf packs in the state. Wolf captures included 4 adult males (average 88.0 lbs), 2 adult females (average 74.5 lbs), 3 yearling females (average 67.5 lbs), 4 pup males (range 10-41 lbs), and 2 pup females (31 and 42 lbs). A total of 1554 trap nights were used by DNR to capture 10 wolves in northern Wisconsin. Sixty-six wolf territories were identified in Wisconsin in winter 2000-2001 (Figure 1). Fifty seven packs occurred in northern Wisconsin in Zone 1, and 9 packs occurred in the central forest in Zone 2. Two territories continue to be located in Vilas and Forest Counties in northeast Wisconsin.

A total of 51 radio collared wolves were monitored in 31 wolf packs in Wisconsin, and 2 wolf packs in Minnesota. At least 8 wolves were dispersers during portions of the study period, including a wolf that dispersed into Minnesota (298M), one that dispersed into Michigan (318F), and one Michigan wolf that dispersed into Wisconsin (M036F). Also a Michigan wolf dispersed into Wisconsin, but was not detected until killed by vehicle collision in southern Wisconsin (M071F). Sex-age composition of radio collared wolves monitored included: 18 adult males, 20 adult females, 2 yearling males, 7 yearling females, 2 pup males and 2 pup females (age during the majority of study period or age at capture for wolves live trapped in 2001).

Mean winter home range for 22 adult wolves with VHF radio collars was 34 square miles, and ranged from 10 to 70 square miles. Two collared females monitored by satellite had home range areas of 98 and 125 square miles; large number of observations and possibly some errors in locational information may have inflated the size of these home range areas (Ballard et al. 1998). The smallest adult home range was 10 square miles for the Pelican Lake lone female (332F), and the largest was the South Empire pack. Home range of adults with packs were all 20 square miles or larger.

Dispersing Wolves

Wolf 002F had moved north into Jackson County from the Wildcat Mound pack in winter 1999-2000 as a 2 year old female. Although roaming the areas of the Noch Hanai pack in summer 2000, she did not seem to join the pack. In fall, she began to roam further north into southern Clark County, and was found dead in the area on 22 November 2000; about 20 miles north of her original captive site in the Wildcat Mound pack.

Wolf M036F was caught in western Gogebic County, Michigan on 5 May 2000, but during the summer spent time both in Iron County Wisconsin and western Upper Michigan. During winter 2000-2001, wolf M036F gradually moved westward into the Bad River Indian reservation, and joined the West Firelane pack on the reservation. In spring she appeared to have become the alpha female of the West Firelane pack and may have had pups. Her new home was about 20 miles west of her original home.

Wolf 0071F was captured as a female pup in northwest Mackinac County, Michigan on 17 August 2000. She was lost to Michigan biologists in January 2001, and was found dead along Highway I- 94 near Johnson Creek, Jefferson County, Wisconsin on 9 March 2001. If she had moved across northern Lake Michigan, and south into Wisconsin along the western edge of Green Bay, her minimum travel distance would have been 300 miles. If the wolf would have crossed portions of Green Bay, the distance could have been slightly less. In any case, this would be a record movement for a wolf pup.

Wolf 250M was caught as a male pup on 9 September 2000 in the Black Lake pack, Sawyer County, near Clam Lake. He remained in that territory during fall and early winter. In late January and early February, he began to spend time in the Ghost Lake pack area, 8 to 10 miles to the north. A second series of extra-territorial travel occurred in late February and early March. After 23 March 2001, 250M made a more permanent dispersal from his natal pack, and began to regularly associate with adult female 241F of the Ghost Lake pack on 24 April.

Wolf 269M was caught as a male pup in the Dead Creek pack of northern Monroe County on 17 September 1999. He dispersed northward as a yearling after 30 November 2000. He traveled north through Juneau and Wood counties before settling into an area near the Noch Hanai pack in northern Jackson and southern Clark counties. His new home range area was about 17 miles north of his natal pack.

Wolf 298M was caught as a yearling male on 8 June 1999 in the North Empire pack of western Douglas County. He dispersed westward into Minnesota after 2 October 2000 as a 2 year old. He joined the Tamarack River pack in Minnesota in late October, about 29 miles southwest of the North Empire pack.

Wolf 318F was caught as a yearling female in the Nineweb Lake pack of northern Vilas County on 10 May 2000. She occupied a large home range in summer (98 square miles) and was probably preparing to disperse. She made at least 3 long distance moves north into the Upper Peninsula of Michigan in winter, with moves up to 31 miles from her natal territory. She made a final dispersal move after 14 March 2001, and moved about 40 miles north of her natal pack. She was last detected by a WDNR pilot in southern Houghton County , Michigan on 25 May 2001, and was recaptured by Michigan biologists in eastern Schoolcraft County, Michigan on 31 May 2001; she had apparently traveled eastward 133 miles in 6 days!

Wolf 333F was caught in the Wilson Flowage Pack on 23 May 2000 as a yearling female. She initially moved about 11 miles north of the territory in late May, and in mid June moved 27 miles to the southeast. She seemed to have joined the Little Rice River Pack in Oneida County and remained in the pack territory for the next month and a half. At the end of July, she was found dead in eastern Price County, 12 miles northwest of the Little Rice River Pack and 7 miles southeast of her original capture site.

Adult male 337M was caught and collared in the Wildcat Mound Pack of Jackson County on 17 July 2000. He dispersed eastward from his home territory after 30 November 2000, and by mid December was 58 miles eastward in western Waushara County. In late December and early January, he moved southward along the west side of Highway 51 (I-39). By 10 January 2001 he had moved into northern Columbia County, about 78 miles southeast of his natal territory, and 3 miles northwest of Portage. His signal was lost afterwards, and apparently dispersed out of range, or perhaps was killed. The site near Portage was also visited by an adult female from central Minnesota in May 1999 (Merrill and Mech 2000), and yearling female from Ely, Minnesota was killed by vehicle collision nearby in August 1994 (Mech, et al. 1995).

Wolf Count Summary

Through radio telemetry monitoring of collared packs and snow tracking of non collared packs, a total statewide count was made of 251-253 wolves in winter 2000-2001 (Table 3). Wolves occurred in 66 packs and included at least 10 lone wolves. The wolf count included 243-246 wolves outside Indian reservations. Using last year's count of 248 wolves, the population increased by only 1% or remained about the same (Figure 2). The wolf population had increased an average of 19% annually since 1985, and this was only the second time that the population had not increased by 15% or more in the 16 year period (Figure 2). The population declined by 11% in 1993, the year after sarcoptic mange was first detected in Wisconsin wolves.

Average pack size was 3.7 wolves (range 2 to 9 wolves). Wolf territories and interstitial areas covered 3340 square miles at a density of 1 wolf/14 square miles. Wolf counts were based on 484 radio locations of 25 packs and 6 loners in which 108 wolves were seen or detected; in addition, 2 satellite collared wolves were monitored during the period. Non collared packs and some collared packs were surveyed by 4081 miles of snow track surveys along snow covered roads. Volunteer carnivore trackers also surveyed 3560 miles of snow covered roads.

Twenty-four wolves, including 14 radio collared wolves, were detected dead in Wisconsin and Minnesota during the study period (Table 4). Mortality of collared wolves included 5 from sarcoptic mange, 1 with inner ear infection and mange, 1 killed by other wolves, 2 shootings, 2 vehicle collisions, 1 capture related, and 2 unknown mortalities. Overall natural mortality comprised 58% of known mortality among collared wolves.

Ten non-collared wolves were also found dead in the state, and these all died from vehicle collisions. Mortality for non-collared wolves is probably biased toward vehicle collisions. Half of these mortalities were pups, a group that is generally under represented among collared wolves. Pups may also be more susceptible to vehicle collisions.

Mortality of collared wolves monitored by the Wisconsin DNR from 1979 through June 2001 is shown in Table 5. Human caused mortality accounted for 56% of mortality during the 22 year period. Illegal shootings continue to decline; 57% of these listed in Table 5 occurred prior to June 1991. Vehicle collisions seem to be on the increase and 91% occurred after June 1991. Disease losses in the 1990's and 2000's have been mainly due to sarcoptic mange.

Statewide Wolf Distribution

Reports of 214 wolf observations from private citizen and agency personnel were collected from 40 Wisconsin counties (Table 1). Only observations judged to be "probable" or "possible" were reported, although some may include coyotes, wolf dog hybrids or large dogs mistaken for wolves. The
current study period has had the most extensive area over which wolves have been reported. The observation rate was higher than 1999-2000 (174) and 1998-1999 (150). It appears that since the peak count in 1997-1998 (224), observation rates have gradually again increased. These reports are probably most useful for detecting distribution of wolves. Wolf observations were reported for all counties with wolf packs except Taylor County, and highest rates were reported for Vilas (23), Iron (21), Price (20) and Bayfield (19).

Job 106.3 WOLF HEALTH MONITORING

Disease testing was not completed for wolves captured in 2000 at the time of this report. Wolves live captured were examined externally for evidence of sarcoptic mange. Two (13%) of 15 captured wolves showed some slight hair loss, indicating possible mange. A total of 5 of 35 actively collared wolves on the air in late fall died with severe cases of mange over winter. Therefore, the losses represent 14% of collared wolves in Wisconsin, and may have been a factor in the lack of population growth. The winter was more severe than the previous two winters, and apparently had a more drastic effect on wolves suffering from sarcoptic mange.

Twenty-three of twenty-five wolves found in the field were sent to the National Wildlife Health Center for complete necropsies, and allowed verification of mange in Wisconsin wolves.

JOB 106.4 HABITAT MANAGEMENT

Comments were made to the Chequamegon-Nicolet National Forest on management plans and proposed timber sales during the study period. Comments were also made on the Forest Service Roadless Area Conservation proposal that would designate 108 square miles (15%) of the Wisconsin national forest as roadless areas. The proposal would prohibit future road construction and limit timber sales to management for stewardship purposes. The roadless areas were in areas of suitable wolf habitat, and enactment of the plan would help maintain these areas of wolf habitat.

A rough draft of a booklet on habitat management for wolves was written. A search is underway to identify an organization willing to print and publish the booklet.

JOB 106.5 WOLF DEPREDATION MANAGEMENT

Eight cases of wolf depredation on livestock and pets occurred during the study period, including 6 cases involving livestock or poultry and 2 cases involving dogs (Table 7). Depredation losses included 12 calves killed, 30 calves missing (may include other losses), 3 dogs killed and 60 poultry killed. Depredation on livestock and poultry occurred on 5 farms in 5 counties. Depredation on dogs included 1 dog killed during bear training, and 2 dogs killed while bobcat hunting. Five of 66 packs found in the state were involved in depredation, and only 3 packs were involved in depredation on livestock or poultry. Lone wolves or possibly wolf dog hybrids caused depredation in 2 cases.

Two wolves translocated from a deer farm last period were monitored throughout the current study period. Wolf 289F was released in western Florence County in May 2000 and roamed an area from western Vilas County, Wisconsin to Delta County Michigan. She eventually settled into eastern Vilas County, near Conover.

Wolf 332F was also released in western Florence County but she traveled southwest into southern Oneida County. Wolf 332F traveled extensively through northern Langlade and western Forest County before settling into an area near Pelican Lake in Oneida County. Neither female was thought to have found a mate. No additional depredation was caused by the 2 translocated females. Both were released over 50 miles from the depredation site.

In May 2001, depredations occurred on calves on a farm in northern Burnett County. The farm had received wolf depredation since 1995, and lost calves every year since then, except 1999. A lactating adult female was caught on the farm on 26 May 2001. She was fitted with a radio collar and dog shock collar, and was released 3.3 miles away from the farm. Three to four triggering devices that sent shocks for up to 0.3 miles away were set on the farm, and seemed to eliminate depredation for the remainder of the study period.

In cooperation with the University of Wisconsin- Madison researchers, a report was written summarizing wolf depredation in Wisconsin from 1976 to 2000. The report being written with Adrian Treves, Lisa Naughton, Rob Rose, Randy Jurewicz, Bob Willging and Adrian Wydeven was submitted to the Wildlife Society Bulletin.

JOB 106.5 WOLF EDUCATION PROGRAMS

During the study period, 66 talks were given to 3579 people by WDNR and USDA-WS personnel. Persons giving talks included Adrian Wydeven, Bruce Kohn, Dick Thiel, Jane Wiedenhoeft, Wayne Hall, Greg Kessler, Ron Schultz, Sarah Boles, Linda Winn, Gary Dunsmore, Scott Beckerman (USDA-WS) and Dan Hirchert (USDA-WS). Talks given included 36 talks to 1479 people by wolf program personnel, 28 talks to 2000 people by other DNR personnel, and 2 talks to 100 people by USDA-WS personnel. Talks included training for 20 TWA volunteers in August, and training for 118 volunteer carnivore trackers in fall. The WDNR cooperated with TWA to sponsor Wolf Awareness Week in October 2000, and distributed over 6000 educational wolf posters within the state. The project ecologist attended 3 TWA Board Meetings during the period to coordinate wolf education. The project ecologist had 80 media contacts during the study period including 34 newspaper, 28 radio, 15 television and 3 book author interviews. Major issues were federal wolf reclassification, wolf shootings, mange outbreak in wolves and new wolf population count in spring 2001.

JOB 106.7 LAW ENFORCEMENT

Project personnel assisted DNR wardens and Federal Special Agents in 2 wolf shootings. News releases were developed for wolf shootings in Price County in July 2000 and Oneida County in February 2001. Reward funds were secured from the Timber Wolf Alliance and Defenders of Wildlife for both shootings. Investigations of possible illegal activity was conducted on all wolves found dead in the state.

JOB 106.8 INTERAGENCY COOPERATION AND COORDINATION

The Wisconsin Wolf Technical Committee consisting of WDNR, U.S. Forest Service, GLIFWC, U. S. Fish and Wildlife Service, USDA-Wildlife Services, County Forests, University of Wisconsin-Stevens Point, Wisconsin Conservation Congress, and private farmer met on 22 May 2001 to discuss meeting with wolf stakeholders and review wolf management in the state. The project ecologist served on the Eastern Gray Wolf Recovery Team, and held 3 conference call meetings during the period. The WDNR attended and provided information at 3 informational meetings in August 2000 to address wolf reclassification in Ashland, Madison and Black River Falls. The WDNR provided supportive testimony at public hearings on wolf reclassification in Madison and Duluth in October 2000.

Other meetings were also attended to help coordinate and cooperate on wolf management. The project ecologist attended a 3-day meeting in Rumford, Maine to discuss and examine potential for wolf recovery in Northeast U.S. Meetings were held on state

wolf population monitoring with interested parties in DNR and other agencies in October 2000 and April 2001. Information on wolf management in Wisconsin was presented at a Carnivore Conservation workshop in Denver Colorado on 13-15 November 2000. A meeting was held with U.S. Fish and Wildlife Service on 18 January 2001 to coordinate and plan research on wolves in central Wisconsin. A meeting was held with members of the Ho-Chunk Nation to coordinate and cooperate on wolf research and management in central Wisconsin. Wolf committee members met with the Wisconsin wolf stakeholders committee to get public input into State wolf management in April 2001. The Great Lakes Wolf Stewards group met on 11 and 12 April 2001 to coordinate wolf management for the 3-state region. The project ecologist provided wolf information at a USDA-Wildlife Services meeting on 8 May 2001. WDNR and Wildlife Services met on a farm in northern Burnett County to coordinate depredation control management with local farmers on 24 May 2001.

JOB 106.9 PROGRAM GUIDANCE AND OVERSIGHT

The second meeting was held with the Wisconsin Wolf Stakeholders Committee on 7 April 2001 to discuss and review the status of the wolf plan. The committee voiced support for regulations on wolf dog hybrids and greater Federal funding for USDA-Wildlife Service. The DNR Wolf Technical Advisory Committee met on 22 May 2001 to address concerns by the wolf stakeholders, and review the status of the wolf management plan.

JOB 106.10 VOLUNTEER PROGRAMS

Twenty volunteers were trained at a Timber Wolf Alliance workshop on 4-6 August 2000. A total of 118 volunteer trackers were trained during 3 training sessions in the fall at Wascott, Treehaven (Tomahawk) and Sandhill Wildlife Area (Babcock). Over 108 people conducted surveys on 55 survey blocks (about 200 square miles each) along 3560 miles. Volunteers also assisted with trapping and radio collaring of wolves and summer howl surveys. Members of the Timber Wolf Alliance, speakers bureau, provided many talks across the state.

JOB 106.11 WOLF RESEARCH

Work continued with researchers from the University of Wisconsin-Madison to examine wolf depredation on domestic animals and attempt to develop landscape predictions of likely future depredation sites. Researchers Adrian Treves and Lisa Naughton are heading up the research, with involvement from graduate student Robert Rose. Other cooperators in the research are Adrian Wydeven, Randy Jurewicz and Bob Willging. A paper was submitted to the *Wildlife Society Bulletin* titled "Wolf depredation on domestic animals: control and compensation in Wisconsin, 1976-2000".

Paul Keenlance, Ph.D candidate at Michigan State is conducting analysis on suitability of various landscapes as wolf habitat, and is attempting to refine earlier research on impact of highway development (Kohn et al. 2000) and GIS analysis of wolf habitat (Mladenoff et al. 1995).

In summer 2000, undergraduate Jennifer Hansen of University of Wisconsin-Madison conducted analysis of wolf mortality in Wisconsin in relationship to road densities. Jennifer found that most mortalities of wolves occur at high road densities. Her work was included in a report submitted for publication in *Endangered Species Update*, "Road Density as a Factor in Habitat Selection by Wolves and Other Carnivores in the Great Lakes Region". The report is authored by Adrian Wydeven, David Mladenoff, Ted Sickley, Bruce Kohn, Dick Thiel and Jennifer Hansen.

Beth Sutherland, graduate student at University of Wisconsin-Madison, continues to examine habitat use by dispersing wolves, and is attempting to identify possible travel corridors.

Meetings were held with the U.S. Fish and Wildlife Service (Necedah National Wildlife Refuge) and the Ho-Chunk Nation during winter to encourage and promote more extensive research of wolves in central Wisconsin.

Research was conducted on use of shock collars to discourage livestock depredation by wolves. Wolf 724F had been fitted with shock collars in 1998 and 1999 in northern Burnett County. A shock collar was again placed on another wolf (367F) in spring 2001. Research on wolf 724F was written up in a paper titled "Testing of Dog Training Collars to Deter Depredation by Gray Wolves (*Canis lupus*)" and submitted for publication. The research thus far indicates some usefulness of shock collars as a form of aversive conditioning or non-lethal control.

Several other reports on wolf biology and ecology were submitted or published during the study period. The "Wisconsin Gray Wolf Population in 1999-2000" was published in the *Wisconsin Wildlife Surveys*. "Death of Gray Wolves in Porcupine Dens in Wisconsin" was written by Adrian Wydeven, Ron Schultz, and Tom Doolittle and was submitted to the *Canadian Field Naturalist*. Also fall, winter and spring progress reports were written on wolf population monitoring.

JOB 106.12 WOLF-DOG HYBRIDS AND CAPTIVE WOLVES

Although a captive wildlife regulation bill was developed in the state legislature during the period, no bill was passed. The captive wildlife regulations contain regulations on wolf-dog hybrids. A member of the Wolf Stakeholders group had agreed to send a letter to key legislators to encourage submission and passage of the bill; all the stakeholders supported this action.

Wolf-dog hybrids were regulated in Michigan in 2000. Some hybrid owners attempted to sell pups in northern Wisconsin after they became regulated in Michigan.

Sixteen cases of suspected wolf-dog hybrid incidents were reported during the study period. Injury to people, or injury or death to domestic animals occurred in 5 cases. Four cases included deaths of wolf-dog hybrids which involved time and expenses used to search, retrieve, examine, identify and dispose of carcasses by DNR personnel. Wolf-dog hybrids continue to consume valuable time and effort by DNR employees that could be better spent dealing with conservation of wolves and other wildlife.

JOB 106.13 WOLF SPECIMEN MANAGEMENT

Twenty-four wolf carcasses were handled during the study period. Most of the useable carcasses continued to go to the University of Wisconsin Zoology Museum. The remains of wolf 274M found dead in Jackson County will be kept at the Sandhill Wildlife Area in Babcock. With state reclassification to threatened status, wolf carcasses may be made available to DNR offices, nature centers, tribal offices and cultural centers. Wolf specimens handled by DNR region included 17 in the northern region, 5 in the west-central region, 1 in the northeast region and 1 in the south-central region.

JOB 106.14 ECOTOURISM

DNR participated in talks/field trips for: Natural Resource Foundation in July 2000 for 43 people, Timber Wolf Alliance workshop in August 2000 for 28 people, and Nicolet College in January 2001 for 16 people. These activities had people travel from throughout Wisconsin and adjacent states to visit areas of wolf range in Wisconsin and make use of local facilities and businesses.

Programs on wolves were also presented at Treehaven near Tomahawk, at Trees for Tomorrow in Eagle River, and Sandhill Wildlife Area near Babcock. The wolf exhibit at the Northern Great Lakes Visitor Center provided an additional attraction for people visiting the Ashland area. No detrimental effects of ecotourism on wolves were detected during the study period.

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Table 1. Capture data on wolves caught in Wisconsin in 2000.

Wolf Number	Sex/Age[a]	Weight (lbs)	Pack/Area	County	Date Captured
247	F/P	31	Black Lake	Sawyer	04 Sep 00
248	M/A	78	Torch River	Ashland	28 Jun 00
250	M/P	30	Black Lake	Sawyer	09 Sep 00
289[b]	F/A	80	Little Rice River/Relocated	Oneida	26 Apr 00
310	F/P	42	Dead Creek	Jackson	15 Sep 00
311	F/Y	76	Bear Bluff	Jackson	24 Sep 00
318	F/Y	~60	Nineweb Lake	Vilas	11 May 00
332[c]	F/A	69	Little Rice River/Relocated	Oneida	10 May 00
333	F/Y	59	Wilson Flowage	Price	23 May 00
334	M/A	108	Wilson Flowage	Price	23 May 00
335[d]	M/P	10	Bootjack Lake	Oneida	30 May 00
336[d]	M/P	26	Bootjack Lake	Oneida	10 Jul 00
337	M/A	80	Wildcat Mound	Jackson	17 Jul 00
351	M/A	86	Chippewa River	Iron	17 Jun 00
353	M/P	41	Bootjack Lake	Oneida	12 Sep 00

[a] Age at time of capture assuming birth date 1 April (P = Pup, Y = Yearling, A = Adult)
[b] Captured by Wildlife Services on game farm, relocated to Florence County 2 May 00.
[c] Captured by Wildlife Services on game farm, relocated to Forest County 29 May 00.
[d] Not collared, too small.

Table 2. Radio telemetry data on wolves monitored from July 1, 2000 – June 30, 2001 in Wisconsin.

Wolf # & Sex	Age[a]	Pack[b]	Date Captured	Last Date	# of Locations[c]	Winter Territory Size (mi^2)	# of Wolves in Territory[d]
002F	Y	Disperser	10 May 98	22 Nov 00**	139	7	-
M036F	Y	West Firelane	4 May 00[e]	Ongoing	17	69	3-4
155M	A	Moose Road	6 May 97	Ongoing	317	26	2
229F	A	Penokee Ridge/Loner?	17 Jul 98[f]	14 Feb 01**	380	21	1?
241F	P	Ghost Lake	20 Nov 97[g]	Ongoing	177	42	4
244F	A	North Willow	23 Jul 97	Ongoing	189	44	5
245F	P	Hoffman Lake	30 Jul 97	Ongoing	202	35	5
247F	P	Black Lake	4 Sep 00	10 Oct 00**	8	4	4
248M	A	Torch River	28 Jun 00	Ongoing	53	22	5
250M	P	Black Lake/Ghost Lake	9 Sep 00	Ongoing	43	30	4[h]
266F	Y	Bird Sanctuary	7 Aug 96	30 Oct 00**	351	NE[i]	4
267M	A	North Empire	28 Aug 96	2 Apr 01*	363	35	2
268M	Y	Truck Trail	11 Jun 97[j]	Ongoing	302	46	3
269M	P	Dead Creek/Disperser	17 Sep 99	Ongoing	97	17[k]	5
280M	Y	MN pack	13 May 98	26 Dec 00**	165	8	-
282F	Y	Little Rice River	10 May 98	14 Feb 01**	149	28	0
285F	A	Ranger Island	24 Aug 98	Ongoing	145	20	6
286F	Y	Brunet River	5 Sep 98	Ongoing	143	23	2
289F	A	Pioneer Creek/Loner?	26 Apr 00[l]	Ongoing	220	98	1
291M	A	Chain Lakes	27 Jun 99	Ongoing	112	46	3
292M	Y	Tranus Lake	21 May 99	Ongoing	122	20	5
293F	A	Frog Creek	23 May 99	14 Feb 01**	101	24	4
294M	A	Totagatic River	23 May 99	Ongoing	121	33	2
295F	Y	Totagatic River	25 May 99	Ongoing	122	35	2
296M	Y	Crotte Creek	28 May 99	Ongoing	120	21	6
297M	A	South Empire	2 Jun 99	Ongoing	118	70	4
298M	Y	North Empire/Tamarack River	8 Jun 99	Ongoing	114	52[m]	3
300F	A	Harrison Hills	18 May 01	Ongoing	6	NE	-
309F	P	Iron Run	15 Nov 99	Ongoing	102	20	2
M310M	P	Brush Creek	2 Nov 97[n]	Ongoing	121	30	7
310F	P	Dead Creek	15 Sep 00	14 Nov 00[o]	10	13	5
311F	Y	Bear Bluff	24 Sep 00	Ongoing	180	125	4
316F	A	Wintergreen	20 Oct 99	Ongoing	91	52	3

Table 2. (Cont.)

Wolf # & Sex	Age[a]	Pack[b]	Date Captured	Last Date	# of Locations[c]	Winter Territory Size (mi^2)	# of Wolves in Territory[d]
318F	Y	Disperser	11 May 00	25 May 01[p]	55	NE	-
332F	A	Pelican Lake/Loner?	10 May 00	Ongoing	73	10	1
333F	Y	Wilson Flowage/Disperser	23 May 00	31 Jul 00	26	NE	-
334M	A	Wilson Flowage	23 May 00	28 Dec 00[**]	37	8	3
336M	Y	Bootjack Lake	3 Jun 01	Ongoing	5	NE	2
337M	A	Wildcat Mound/Disperser	17 Jul 00	10 Jan 01[*]	28	14[k]	5
341F	Y	Wildcat Mound	31 May 01	Ongoing	4	NE	5
343M	A	South Bluff/Bear Bluff?	12 Jun 01	Ongoing	3	NE	-
348M	A	Dead Creek	23 May 01	Ongoing	5	NE	5
351M	A	Chippewa River	17 Jun 00	Ongoing	54	51	9
352F	A	Chase Brook	1 May 01	1 May 01[**]	2	NE	4
353M	P	Bootjack Lake	12 Sep 00	14 Mar 01[*]	27	39	2
355M	A	North Willow	28 Jun 01	Ongoing	1	NE	5
367F	A	Chase Brook	26 May 01	Ongoing	10	NE	4
369F	A	Little Sioux R/Siskiwit Lake.	25 Jun 01	Ongoing	3	NE	-
370F	A	Black Lake	30 Jun 01	Ongoing	1	NE	4
376F	Y	Little Rice River	12 Jun 01	Ongoing	4	NE	0
724F	A	Chase Brook	26 April 99[q]	Ongoing	313	32	4

[a] Age at time of capture (P = Pup, Y = Yearling, A = Adult)
[b] Pack during winter of the study period
[c] Total locations from the time of capture
[d] Number of wolves in pack during midwinter
[e] Captured in Gogebic County, Michigan
[f] Recaptured wolf; first captured as a yearling in Sawyer County on 9 July 1993
[g] Recaptured wolf; first captured in Ashland County on 23 Jun 1997, 19 lb pup too small to collar
[h] Black Lake pack
[i] No estimate
[j] Recaptured wolf; first captured as a pup in Douglas County on 28 Aug 1996
[k] Based on 11 pre-dispersal movements
[l] Recaptured wolf, first captured in Douglas County on 5 Jun 1998
[m] Based on 26 post-dispersal movements
[n] Initial capture in Houghton County, Michigan; locations listed for Wisconsin only
[o] Slipped collar
[p] Dispersed to Michigan
[q] Recaptured wolf; first captured in Douglas County 28 May 1997
[*] Lost signal
[**] Died

Table 3. Minimum estimation of Wisconsin's timber wolf population in winter 2000-2001.

Pack/Area/Wolf	Counties	No. of Wolves	Evidence[a]
Augustine Lake*	Iron/Ashland	5	T
Averill Creek	Lincoln	5	T
Bear Bluff*	Jackson/Wood/Juneau	4	T
Bearsdale*	Bayfield	5	T
Beaver Creek/Yellow River	Juneau	5	T
Bird Sanctuary*	Douglas	4	T
Black Lake*	Ashland/Sawyer	4	T
Blue Hills	Rusk	5	T
Bootjack Lake*	Price/Oneida	2	R/T
Brunet River	Sawyer	2	R
Brush Creek*	Ashland	7	T
Casey Creek	Douglas	5	T
Chain Lakes	Douglas/Washburn	3	R
Chase Brook	Burnett	4	?
Chippewa River	Iron/Ashland	9	R/T
Crex Meadow	Burnett	2	T
Crotte Creek*	Douglas	6	R/T
Davis Lake	Sawyer	2	T
Dead Creek	Jackson/Monroe	5	T
Eastside Firelane	Ashland	3	T
Flag River*	Bayfield	5	T
Frog Creek*	Washburn	4	R
Ghost Lake	Bayfield/Sawyer	4	R/T
Giant Pine	Forest	2	T
Haystack Corner	Sawyer/Rusk	3	T
Hellhole Creek	Bayfield/Ashland	6-7	T
Hoffman Lake	Price/Ashland/Iron	5	R/T
Hungry Run*	Ashland	2	T
Iron Run	Clark	2	T
Kidrick Swamp	Taylor	5	T
Little Rice River	Oneida	0	R/T
Little Sioux River/Sandpoint	Bayfield	3+	T
Log Creek	Ashland/Price	3	T
Moose Lake*	Douglas	4	T
Moose Road	Douglas/Pine	2	R
Moreland Lake	Bayfield	3	T
Morrison/Potato River	Ashland/Iron	3-4	T
Murry's Landing	Iron	2	T
Nineweb Lake	Vilas	3	T
Noch Hanai	Jackson/Clark	4	R/T
North Empire	Douglas	2	R
North Willow	Oneida	5	R/T
O'Brien Lake*	Iron	3	T
Orienta Falls	Douglas/Bayfield	2	T
Pine Lake*	Iron	5	T
Price Creek	Price/Sawyer	4	T
Rainbow Lake	Bayfield	2	T

Table 3. cont.

Pack/Area/Wolf	Counties	No. of Wolves	Evidence[a]
Ranger Island	Lincoln	6	R/T
Scotchman Lake	Oneida	2	T
Shanagolden*	Ashland	3	T
Shoberg Lake*	Douglas	4	T
Smoky Hill*	Bayfield/Sawyer	4	T
South Empire	Douglas	4	R/T
Spirit Lake*	Lincoln	2	T
Suk-Cerney/Beaver Creek	Juneau	5	T
Thornapple River	Sawyer	2	T
Torch River*	Ashland	5	R/T
Totagatic River	Burnett/Douglas	2	R/T
Tranus Lake	Washburn	5	R/T
Truck Trail	Douglas/Pine	3	R
Tupper Creek	Sawyer	2	T
Two Korner	Jackson/Clark	2	T
W269	Jackson	2	T
West Firelane	Ashland	2	R/T
Wildcat Mound	Jackson	5	T
Wilson Flowage	Price	3	T
Wintergreen Lake	Price	3	R
Total Pack Members **66 Packs = 3.7 wolves/pack**		**241-243+**	
Dispersers & Loners			
W289, Pioneer Creek	Vilas	1	S/T/O
W332. Pelican	Oneida/Langlade	1	R
Bombing Range	Wood	1	T
Camp Three Lake	Forest	1	T
Clifford	Oneida/Price	1	T
Ft. McCoy	Monroe/Jackson	1	T
Porcupine Lake	Bayfield	1	T
Sandhill loner	Wood	1	T
Sterling Barrens	Polk/Burnett	1	T
Stuntz Brook	Washburn	1	T
Total Loners		**10**	
Grand Total All Wolves	**251-253+**		
Indian Reservation Wolves	**7-8+**		
Wolves Outside Reservations	**243-246+**		

[a] Evidence: O = observations
R = radio-telemetry surveys
S = satellite monitored
T = track and sign surveys

*Pack with breeding activity

Table 4. Wolves dying in Wisconsin from 1 July 2000 to 30 June 2001.

Wolf # & Sex	Age[a]	Date Captured	Date Died	County Died	Cause of Death
----?	P	-----	8 Jul 00	Ashland	Vehicle Collision
333F	Y	23 May 00	31 Jul 00	Price	Shooting
----?	A	-----	6 Aug 00	Juneau	Vehicle Collision?
----M	P	-----	14 Aug 00	Ashland	Vehicle Collision
----M	P?	-----	24 Aug 00	Douglas	Vehicle Collision
238M	6	21 May 95	25 Aug 00	Jackson	Vehicle Collision
*----M	P	-----	5 Sep 00	Douglas	Vehicle Collision
247F	P	4 Sep 00	10 Oct 00	Sawyer	Unknown
266F	5	7 Aug 96	30 Oct 00	Douglas	Other wolves
----M	P	-----	13 Nov 00	Jackson	Vehicle Collision
274M	A	28 Aug 96	? Nov 00	Juneau	Unknown
002F	3	10 May 98	22 Nov 00	Clark	Mange
----M	A	-----	17 Dec 00	Shawano	Vehicle Collision
290M	A	13 May 99	22 Dec 00	Bayfield	Mange
280M	3	13 May 98	26 Dec 00	Pine	Mange
334M	A	23 May 00	28 Dec 00	Price	Mange
----M	A	-----	12 Jan 01	Douglas	Vehicle Collision
229F	8	9 Jul 93	14 Feb 01	Ashland	Ear infection/Mange
282F	3	10 May 98	14 Feb 01	Oneida	Shooting
293F	A	23 May 99	14 Feb 01	Washburn	Mange
0071F	P	MI capture	9 Mar 01	Jefferson	Vehicle Collision
----M	A	-----	29 Apr 01	Bayfield	Vehicle Collision
352F	A	1 May 01	1 May 01	Burnett	Capture Related
----F	A	-----	5 Jun 01	Douglas	Vehicle Collision?

[a] Age at time of death

*May be wolf-dog hybrid

Table 5. Mortality summary of radio-collared wolves in Wisconsin and adjacent areas of Minnesota from October 1979 – June 2001.

	Cause of Death	Number	% Known Mortality
Human Causes	Capture Related	3	4%
	Shot Wound*	21	28%
	Trapped	3	4%
	Vehicle Collision	11	15%
	Unknown Human Causes	4	5%
	Total Human Causes	*42*	*56%*
Natural Causes	Birthing Complications	1	1%
	Disease	18	24%
	Killed by Other Wolves	11	15%
	Unknown Natural Causes	3	4%
	Total Natural Causes	*33*	*44%*
Totals	*Known Mortality*	*75*	*100%*
	Unknown Mortality	8	
	Total Mortality	**83**	

* 20 wolves shot by firearm; 1 wolf by bow and arrow

Table 6. Wolf observations reported by natural resource agency personnel and private citizens in Wisconsin in July 2000 – June 2001.

County	Sightings	Wolves Seen	Track or Sign Observations	Total Observations
Adams	0	0	1	1
Ashland*	10	18	6	16
Bayfield*	16	30	3	19
Buffalo	1	1	0	1
Burnett*	2	2	1	3
Clark*	3	5	3	6
Columbia	4	4	0	4
Dane	1	1	0	1
Douglas*	7	9	7	14
Eau Claire*	0	0	2	2
Florence	2	2	0	2
Fond du Lac	1	1	0	1
Forest*	0	0	5	5
Iron*	13	23	8	21
Jackson*	3	8	2	5
Jefferson	1	2	0	1
Juneau*	2	2	3	5
La Crosse	0	0	1	1
Langlade	3	3	1	4
Lincoln*	4	9	3	7
Manitowoc	1	1	1	2
Marathon	2	3	1	3
Marinette	2	4	2	4
Marquette	2	2	0	2
Monroe*	2	3	0	2
Oconto	1	2	0	1
Oneida*	10	13	5	15
Polk	0	0	1	1
Portage	2	2	0	2
Price*	16	27	4	20
Rock	1	1	0	1
Rusk*	1	1	1	2
Sauk	2	3	0	2

Table 6. cont.

County	Sightings	Wolves Seen	Track or Sign Observations	Total Observations
Sawyer*	4	4	0	4
Shawano	2	2	0	2
Trempealeau	1	1	0	1
Vilas*	20	22	3	23
Washburn*	5	6	1	6
Waushara	0	0	1	1
Wood*	1	1	0	1
Totals	**148**	**218**	**66**	**214**

* Counties with known breeding packs during winter of this study period. No observations were reported from Taylor County where a breeding pack is known to exist.

Table 7. Wolf depredation cases on livestock and pets in Wisconsin, July 1999 through June 2000.

Date	Animal Lost	Pack Involved	County	Payments	Other Actions
28 Jul 00	1 calf	Hybrid/Loner?	Marathon	$500	None
22 Aug 00	4 chickens killed	North Empire	Douglas	$25	None
25 Aug 00	1 dog (Plott)	Chain Lake	Douglas	$2878.20	None
16 Sep 00	3 calves	Flag River	Bayfield	$1200	None
4 Dec. 00	2 dogs (Black & Tan & Mtn. Cur)	Shoberg Lake	Douglas	$4000	None
2000	2 calves killed 30 calves missing	Chase Brook	Burnett	Pending	None
8 Mar 01	51 chickens 4 pheasants 1 turkey	Hybrid/Loner?	Sawyer	Pending	None
18 May 01[a]	6 calves	Chase Brook	Burnett	Pending	1 trapped, radio & shock collared
8 cases	**12 calves killed (30 missing)** **3 dogs** **55 chickens** **4 pheasant** **1 turkeys**	**5 packs** **2 hybrids/loners?**	**5 counties**	**$8603.20+**	**1 Trapped, radio & shock collared**

[a] Depredations continued through May 26

Table 8. Suspected wolf-dog hybrid incidents and problems in Wisconsin, 1 July 2000 – 31 June 2001.

Date	County	No. of wolf-dogs Sex/Age	Problem	Outcome
7/28/00	Marathon	Possible hybrid or wolf	Calf killed	Unknown
9/09/00	Sauk	Adult/ sex unknown	Running along Road	Hit by vehicle and disappeared.
10/31/00	Kenosha	Unknown	Running Lose	Unknown
11/07/01	Marquette	Unknown	Running Lose	Unknown
01/22/01	Juneau	Adult Female	Killed chickens	Placed in captivity.
02/09/01	Juneau	Adult/ Sex unknown	Running Lose	Unknown
03/06/01	Rock	Adult	Running Lose	Unknown
03/08/01	Sawyer	Possible hybrid or wolf	Killed 56 poultry	Unknown
03/11/01	Langlade	Unknown	Attacked 2 Dogs	Unknown
03/27/01	Portage	Unknown	Running Lose	Unknown
03/28/01	Oconto	Adult /Sex unknown	Found Dead	Skull & Skin saved
04/09/01	Vilas	Adult/ Sex unknown	Found Dead	Unknown
04/19/01	Burnett	Adult/ Sex unknown	Found Dead	Specimen Saved ?
04/23/01	Sawyer	Adult/ Sex unknown	Found Dead	Left at Site
04/30/01	Shawano	Adult Male	Bite Man	Destroyed by Sheriff
05/11/01	Iowa	Adult/ Sex unknown	Running Lose	Unknown
05/23/01	Adams	1 Adult and 2+ pups	Running Lose	Unknown